

1. A transmission power control system in a cellular communication system including a plurality of cells, a plurality of base stations respectively arranged in respective of said plurality of cells, mobile stations located within said cells, and control station provided in common for said plurality of base stations and transmitting control instruction for balance adjustment of transmission power to respective of said mobile stations from said base stations,

wherein said base station comprising control means for controlling initiation of a balance adjustment period for performing said balance adjustment from a frame number determined on the basis of frame number of the balance adjustment period.

2. A transmission power control system as set forth in claim 1, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control means is responsive to reception of said control instruction to perform initiation control of said balance adjustment period from the frame of the frame number CFN to be  $\text{mod}(\text{CFN}, m \times N_{\text{period}}) = L$  (wherein, m is natural number, L is 0 or natural number smaller than  $m \times N_{\text{period}}$  common to all base stations).

3. A transmission power control system as set forth in claim

1, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control means is responsive to reception of said control instruction to perform initiation control of said balance adjustment period from a frame where a number at the first digit as expressing said CFN by  $m \times N_{\text{period}}$  base number (wherein, m is natural number) becomes a predetermined value.

4. A transmission power control system as set forth in claim 1, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control means is responsive to reception of said control instruction to perform initiation control of said balance adjustment period from a frame where said CFN becomes  $m \times N_{\text{period}} + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

5. A transmission power control system as set forth in claim 4, wherein said m is natural number and said L is 0.

20

6. A transmission power control system as set forth in claim 1, wherein said control means resumes said balance adjustment period from a frame defined by the same rule as a rule determining initiation of the balance adjustment period when said frame number is varied from the maximum value to a minimum value or

25

from the minimum value to the maximum value in discontinuous manner.

7. A transmission power control system as set forth in claim 4, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control means resumes said balance adjustment period from a frame to be  $m \times Nperiod + L$  when said frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

8. A transmission power control system as set forth in claim 1, wherein said control station includes means for selecting said Nperiod as a value satisfying a relationship of  $k \times Nperiod = CFNmax$  (k is integer) assuming that a frame number of transmission frame to said mobile station is CFN, said balance adjustment period is Nperiod frame, minimum value of said CFN is 1, maximum value is CFNmax or minimum value is 0 and maximum value is CFNmax - 1, and

control means of each of said base station initiate control of said balance adjustment period from a frame to be  $m \times Nperiod + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

9. A transmission power control system as set forth in claim 1, wherein assuming that a frame number of transmission frame to said mobile station is CFN, said balance adjustment period is Nperiod frame, said control means selects said Nperiod as  
5 a value satisfying a relationship of  $k \times Nperiod = CFNmax$  (k is integer) when minimum value of said CFN is 1, maximum value is CFNmax or minimum value is 0 and maximum value is CFNmax - 1, to initiate control of said balance adjustment period from  
10 a frame to be  $m \times Nperiod + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

10. A transmission power control system as set forth in claim 1, wherein said control means sets an adjustment amount in said balance adjustment at a value of predetermined ratio to a  
15 difference between said transmission power upon initiation of said balance adjustment period and a reference value.

11. A transmission power control method in a cellular communication system including a plurality of cells, a plurality  
20 of base stations respectively arranged in respective of said plurality of cells, mobile stations located within said cells, and control station provided in common for said plurality of base stations and transmitting control instruction for balance adjustment of transmission power to respective of said mobile  
25 stations from said base stations,

wherein said method comprising a control step of  
controlling initiation of a balance adjustment period for  
performing said balance adjustment from a frame number  
determined on the basis of frame number of the balance adjustment  
5 period, in each base station.

12. A transmission power control method as set forth in claim  
11, wherein assuming that a frame number of transmission frame  
to said mobile station is CFN and said balance adjustment period  
10 is Nperiod frame, said control step includes a step of initiating  
control of said balance adjustment period from the frame of  
the frame number CFN to be  $\text{mod}(\text{CFN}, m \times \text{Nperiod}) = L$  (wherein,  
m is natural number, L is or natural number smaller than  $m \times$   
Nperiod common to all base stations) in response to reception  
15 of said control instruction.

13. A transmission power control method as set forth in claim  
11, wherein assuming that a frame number of transmission frame  
to said mobile station is CFN and said balance adjustment period  
20 is Nperiod frame, said control step is responsive to reception  
of said control instruction to perform initiation control of  
said balance adjustment period from a frame where a number at  
the first digit as expressing said CFN by  $m \times \text{Nperiod}$  base number  
(wherein, m is natural number) becomes a predetermined value.

14. A transmission power control method as set forth in claim 11, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control step includes a step responsive to reception of said control instruction to perform initiation control of said balance adjustment period from a frame where said CFN becomes  $m \times Nperiod + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

15. A transmission power control method as set forth in claim 14, wherein said m is natural number and said L is 0.

16. A transmission power control method as set forth in claim 11, wherein said control step resumes said balance adjustment period from a frame defined by the same rule as a rule determining initiation of the balance adjustment period when said frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

20

17. A transmission power control method as set forth in claim 14, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control step resumes said balance adjustment period from a frame to be  $m \times Nperiod + L$  when said

frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

5 18. A transmission power control method as set forth in claim 11, wherein said control station performs a step of selecting said Nperiod as a value satisfying a relationship of  $k \times \text{Nperiod} = \text{CFNmax}$  (k is integer) assuming that a frame number of transmission frame to said mobile station is CFN, said balance  
10 adjustment period is Nperiod frame, minimum value of said CFN is 1, maximum value is CFNmax or minimum value is 0 and maximum value is CFNmax - 1, and

control step in each of said base station initiate control of said balance adjustment period from a frame to be  $m \times \text{Nperiod} + L$  (wherein m is 0 or natural number and L is 0 or natural  
15 number common to all base stations).

19. A transmission power control method as set forth in claim 11, wherein assuming that a frame number of transmission frame  
20 to said mobile station is CFN, said balance adjustment period is Nperiod frame, said control step selects said Nperiod as a value satisfying a relationship of  $k \times \text{Nperiod} = \text{CFNmax}$  (k is integer) when minimum value of said CFN is 1, maximum value is CFNmax or minimum value is 0 and maximum value is CFNmax  
25 - 1, to initiate control of said balance adjustment period from

a frame to be  $m \times N_{\text{period}} + L$  (wherein  $m$  is 0 or natural number and  $L$  is 0 or natural number common to all base stations).

20. A transmission power control method as set forth in claim  
5 11, wherein said control step sets an adjustment amount in said balance adjustment at a value of predetermined ratio to a difference between said transmission power upon initiation of said balance adjustment period and a reference value.

10 21. A base station in a cellular communication system including a plurality of cells, a plurality of said base stations respectively arranged in respective of said plurality of cells, mobile stations located within said cells, and control station provided in common for said plurality of base stations and  
15 transmitting control instruction for balance adjustment of transmission power to respective of said mobile stations from said base stations, said base station comprising:

control means for controlling initiation of a balance adjustment period for performing said balance adjustment from  
20 a frame number determined on the basis of frame number of the balance adjustment period.

22. A base station as set forth in claim 21, wherein assuming that a frame number of transmission frame to said mobile station  
25 is CFN and said balance adjustment period is  $N_{\text{period}}$  frame,



said control means initiation control of said balance adjustment period from the frame of the frame number CFN to be mod (CFN,  $m \times N_{\text{period}}$ ) = L (wherein, m is natural number, L is or natural number smaller than  $m \times N_{\text{period}}$  common to all base stations)  
5 in response to reception of said control instruction.

23. A base station as set forth in claim 21, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is  $N_{\text{period}}$  frame,  
10 said control means is responsive to reception of said control instruction to perform initiation control of said balance adjustment period from a frame where a number at the first digit as expressing said CFN by  $m \times N_{\text{period}}$  base number (wherein, m is natural number) becomes a predetermined value.

15  
24. A base station as set forth in claim 21, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is  $N_{\text{period}}$  frame, said control means is responsive to reception of said control  
20 instruction to perform initiation control of said balance adjustment period from a frame where said CFN becomes  $m \times N_{\text{period}} + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

25 25. A base station as set forth in claim 24, wherein said

m is natural number and said L is 0.

26. A base station as set forth in claim 1, wherein said control means resumes said balance adjustment period from a frame defined by the same rule as a rule determining initiation of the balance adjustment period when said frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

27. A base station as set forth in claim 24, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control means resumes said balance adjustment period from a frame to be  $m \times Nperiod + L$  when said frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

28. A base station as set forth in claim 21, wherein assuming that a frame number of transmission frame to said mobile station is CFN, said balance adjustment period is Nperiod frame, said control means selects said Nperiod as a value satisfying a relationship of  $k \times Nperiod = CFNmax$  (k is integer) when minimum value of said CFN is 1, maximum value is CFNmax or minimum value is 0 and maximum value is  $CFNmax - 1$ , to initiate control of said balance adjustment period from a frame to be  $m \times Nperiod$

+ L (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

29. A base station as set forth in claim 21, wherein said control means sets an adjustment amount in said balance adjustment at a value of predetermined ratio to a difference between said transmission power upon initiation of said balance adjustment period and a reference value.

30. A control station in a cellular communication system including a plurality of cells, a plurality of base stations respectively arranged in respective of said plurality of cells, mobile stations located within said cells, and control station provided in common for said plurality of base stations and transmitting control instruction for balance adjustment of transmission power to respective of said mobile stations from said base stations, each of said base station initiate control of a balance adjustment period from a frame to be  $m \times N_{\text{period}} + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations,  $N_{\text{period}}$  is a period for performing said balance adjustment).

said control station comprising means for selecting said  $N_{\text{period}}$  as a value satisfying a relationship of  $k \times N_{\text{period}} = \text{CFN}_{\text{max}}$  (k is integer) assuming that a frame number of transmission frame to said mobile station is CFN, said balance

adjustment period is  $N_{period}$  frame, minimum value of said CFN is 1, maximum value is  $CFN_{max}$  or minimum value is 0 and maximum value is  $CFN_{max} - 1$ .

5 31. A storage medium storing a transmission power control method in a cellular communication system including a plurality of cells, a plurality of base stations respectively arranged in respective of said plurality of cells, mobile stations located within said cells, and control station provided in common for  
10 said plurality of base stations and transmitting control instruction for balance adjustment of transmission power to respective of said mobile stations from said base stations,  
wherein said control program comprising a control step of controlling initiation of a balance adjustment period for  
15 performing said balance adjustment from a frame number determined on the basis of frame number of the balance adjustment period, in each base station.

32. A storage medium as set forth in claim 31, wherein assuming  
20 that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is  $N_{period}$  frame, said control step includes a step of initiating control of said balance adjustment period from the frame of the frame number CFN to be  $\text{mod}(CFN, m \times N_{period}) = L$  (wherein,  $m$  is natural  
25 number,  $L$  is or natural number smaller than  $m \times N_{period}$  common

to all base stations) in response to reception of said control instruction.

33. A storage medium as set forth in claim 31, wherein assuming  
5 that a frame number of transmission frame to said mobile station  
is CFN and said balance adjustment period is Nperiod frame,  
said control step is responsive to reception of said control  
instruction to perform initiation control of said balance  
adjustment period from a frame where a number at the first digit  
10 as expressing said CFN by  $m \times N_{\text{period}}$  base number (wherein,  
m is natural number) becomes a predetermined value.

34. A storage medium as set forth in claim 31, wherein assuming  
that a frame number of transmission frame to said mobile station  
15 is CFN and said balance adjustment period is Nperiod frame,  
said control step includes a step responsive to reception of  
said control instruction to perform initiation control of said  
balance adjustment period from a frame where said CFN becomes  
 $m \times N_{\text{period}} + L$  (wherein m is 0 or natural number and L is 0  
20 or natural number common to all base stations).

35. A storage medium as set forth in claim 34, wherein said  
m is natural number and said L is 0.

25 36. A storage medium as set forth in claim 31, wherein said

control step resumes said balance adjustment period from a frame defined by the same rule as a rule determining initiation of the balance adjustment period when said frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

37. A storage medium as set forth in claim 34, wherein assuming that a frame number of transmission frame to said mobile station is CFN and said balance adjustment period is Nperiod frame, said control step resumes said balance adjustment period from a frame to be  $m \times N_{\text{period}} + L$  when said frame number is varied from the maximum value to a minimum value or from the minimum value to the maximum value in discontinuous manner.

38. A storage medium as set forth in claim 31, wherein assuming that a frame number of transmission frame to said mobile station is CFN, said balance adjustment period is Nperiod frame, said control step selects said Nperiod as a value satisfying a relationship of  $k \times N_{\text{period}} = \text{CFN}_{\text{max}}$  (k is integer) when minimum value of said CFN is 1, maximum value is CFNmax or minimum value is 0 and maximum value is  $\text{CFN}_{\text{max}} - 1$ , to initiate control of said balance adjustment period from a frame to be  $m \times N_{\text{period}} + L$  (wherein m is 0 or natural number and L is 0 or natural number common to all base stations).

39. A storage medium as set forth in claim 31, wherein said control step sets an adjustment amount in said balance adjustment at a value of predetermined ratio to a difference between said transmission power upon initiation of said balance adjustment period and a reference value.

40. A storage medium storing a transmission power control method in a cellular communication system including a plurality of cells, a plurality of base stations respectively arranged in respective of said plurality of cells, mobile stations located within said cells, and control station provided in common for said plurality of base stations and transmitting control instruction for balance adjustment of transmission power to respective of said mobile stations from said base stations, each of said base station initiate control of a balance adjustment period from a frame to be  $m \times N_{\text{period}} + L$  (wherein  $m$  is 0 or natural number and  $L$  is 0 or natural number common to all base stations,  $N_{\text{period}}$  is a period for performing said balance adjustment).

said control program comprising step of selecting said  $N_{\text{period}}$  as a value satisfying a relationship of  $k \times N_{\text{period}} = \text{CFN}_{\text{max}}$  ( $k$  is integer) assuming that a frame number of transmission frame to said mobile station is  $\text{CFN}$ , said balance adjustment period is  $N_{\text{period}}$  frame, minimum value of said  $\text{CFN}$  is 1, maximum value is  $\text{CFN}_{\text{max}}$  or minimum value is 0 and maximum

value is CFNmax - 1.

41. A transmission power control system as set forth in claim  
1, wherein assuming that a frame number of transmission frame  
5 to said mobile station is CFN, said balance adjustment period  
is Nperiod frame, and said CFN is incremented by one in every  
frame to be reset to 0 when said CFN exceeds a predetrmined number,  
said control means is responsive to reception of said control  
instruction to control said balance adjustment starting at a  
10 frame with CFN modulo Nperiod equal to 0, and repeating for  
every Nperiod frame, and restarting at a frame with CFN=0.

42. A transmission power control method as set forth in claim  
11, wherein assuming that a frame number of transmission frame  
15 to said mobile station is CFN, said balance adjustment period  
is Nperiod frame, and said CFN is incremented by one in every  
frame to be reset to 0 when said CFN exceeds a predetermined  
number, said control step is responsive to reception of said  
control instrucion to control said balance adjustment  
20 starting at a frame with CFN modulo Nperiod equal to 0, and  
repeating for every Nperiod frame, and restarting at a frame  
with CFN=0.

43. A base station as set forth in claim 21, wherein assuming  
25 that a frame number of transmission frame to said mobile station



is CFN, said balance adjustment period is Nperiod frame, and  
said CFN is incremented by one in every frame to be reset to  
0 when said CFN exceeds a predetermined number, said control  
means is responsive to reception of said control instruction  
5 to control said balance adjustment starting at a frame with  
CFN modulo Nperiod equal to 0, and repeating for every Nperiod  
frame, and restarting at frame with CFN=0.

44. A storage medium as set forth in claim 31, wherein assuming  
10 that a frame number of transmission frame to said mobile station  
is CFN, said balance adjustment period is Nperiod frame, and  
said CFN is incremented by one in every frame to be reset to  
0 when said CFN exceeds a predetermined number, said control  
step is responsive to reception of said control instruction  
15 to control said balance adjustment starting at a frame with  
CFN modulo Nperiod equal to 0, and repeating for every Nperiod  
frame, and restarting at a frame with CFN=0.